

What is claimed:

1. A process for producing hydrogen, comprising: contacting an input gas stream comprising steam and carbon monoxide with a water-gas shift catalyst below 350 °C,

wherein the water-gas shift catalyst comprises:

at least 50 wt.% of an oxide support selected from the group consisting of activated alumina, zirconia, titania, silica, zeolites, and combinations thereof; copper or an oxide thereof dispersed on the oxide support;

0.01 to 0.5 wt.% of a platinum group metal selected from the group consisting of platinum, palladium, rhodium, osmium, iridium, ruthenium and combinations thereof dispersed on the oxide support; and

a reducible metal oxide selected from the group consisting of the oxides of chromium, vanadium, molybdenum, cerium, praseodymium, neodymium, titanium, nickel, manganese, cobalt and dispersed on the oxide support.

2. The process of claim 1, wherein the reducible metal oxide comprises cerium oxide.
3. The process of claim 1, wherein the oxide support comprises activated alumina.
4. The process of claim 1, wherein the platinum group metal comprises platinum.
5. A process for producing hydrogen, comprising: contacting an input gas stream comprising steam and carbon monoxide with a water-gas shift catalyst below 350 °C,

wherein the water-gas shift catalyst comprises:

at least 50 wt.% of an oxide support selected from the group consisting of activated alumina, zirconia, titania, silica, zeolites, zinc oxide and combinations thereof;

copper or an oxide thereof dispersed on the oxide support;

0.01 to 0.5 wt.% of a platinum group metal selected from the group consisting of platinum, palladium, rhodium, osmium, iridium, ruthenium and combinations thereof dispersed on the oxide support; and

cerium oxide dispersed on the oxide support.

6. The process of claim 5, wherein the platinum group metal of the water-gas shift catalyst comprises platinum.
7. The process of claim 5, wherein the support of the water-gas shift catalyst comprises activated alumina.
8. The process of claim 5, wherein there is 10 wt.% or more cerium oxide in the water-gas shift catalyst.
9. The process of claim 5, wherein the water-gas shift catalyst is in the form of particles having a mesh size of 12 or greater, and a BET surface area of $10 \text{ m}^2/\text{g}$ or greater.
10. The process of claim 5, wherein the input gas stream further comprises 10% by volume or more of hydrogen.
11. The process of claim 5, wherein there is 10% by volume or more of steam in the input gas stream.
12. The process of claim 5, wherein the input gas stream further comprises up to 2% by volume oxygen.
13. A process for producing hydrogen, comprising: contacting an input gas stream comprising steam and carbon monoxide with a water-gas shift catalyst below 300°C ,
wherein the water-gas shift catalyst comprises:
 - at least 50 wt.% of an alumina support;
 - 6 to 12 wt.% of copper or an oxide thereof dispersed on the alumina support;
 - about 0.01 to about 0.5 wt.% platinum dispersed on the alumina support; and
 - 10 to 25 wt.% cerium oxide dispersed on the alumina support.

14. The process of claim 13, wherein the alumina support of the water-gas shift catalyst is in the form of particles having a mesh size of 12 or greater, and a BET surface area of $10 \text{ m}^2/\text{g}$ or greater.
15. A process for producing hydrogen, comprising: contacting an input gas stream comprising steam and carbon monoxide with a water-gas shift catalyst below 450°C :
wherein the water-gas shift catalyst comprises:
- a cerium oxide support;
 - copper or an oxide thereof dispersed on the cerium oxide support; and
 - 0.1 wt.% or more of a platinum group metal selected from the group consisting of platinum, palladium, rhodium, osmium, iridium, ruthenium and combinations thereof dispersed on the cerium oxide support.
16. The process of claim 15, wherein the platinum group metal of the water-gas shift catalyst comprises platinum.
17. The process of claim 15, wherein a concentration of the copper or oxide thereof in the water-gas shift catalyst is about 4 wt. % to 12 wt. %.
18. The process of claim 15, wherein the input gas stream further comprises 10% by volume or more of hydrogen.
19. The process of claim 15, wherein there is 10% by volume or more of steam in the input gas stream.
20. The process of claim 15, wherein the input gas stream further comprises up to 2% by volume of oxygen.